BUILDING BETTER HOMES

The Lehigh Model Homes

IN the fall of the year 1925, as many will remember, the Lehigh Portland Cement Company conducted a nation-wide architectural competition for the design of moderate-cost firesafe homes of portland cement concrete masonry. Designs for both houses and bungalows were admitted, the only restrictions being a limitation as to size—and the requirement that the exterior walls and bearing partitions should be of concrete block construction while the exteriors were to be surfaced with portland cement stucco.

To this competition, which was carried out under the direction of THE ARCHITECTURAL FORUM, several hundred architectural designers responded with a wide variety of interesting and practical dwelling plans. Over $4000 in prize money was awarded to the twenty-eight prize and honorable mention winners as adjudged by a jury consisting of five prominent architects.

Entrance to Court—Lehigh First Prize Home Built in Kansas City

So great was the interest expressed by those who saw these drawings that it was decided to publish them in book form. Thus, in the spring of this year 1926, there appeared the new book "Twenty-Eight Better Homes,"* containing the twenty-eight prize-winning house and bungalow designs together with a large amount of condensed practical information for prospective homebuilders.

Through advertising and through Lehigh dealers everywhere this book was offered to the public and within a short time the first edition of one hundred thousand copies was practically exhausted—to meet the demands of architects, contractors and homebuilders.

Then came the second definite reaction. After reading this book more information was demanded. Innumerable questions were received, covering the entire range of portland cement concrete masonry construction; stucco work; and the general use of portland cement products in homebuilding.

Anticipating this expression of general public interest, and in order to be in the position of furnishing practical information based on the direct personal experiences of its engineers and officials, the Lehigh Portland Cement Company decided early this year to build four of these prize-winning houses of Lehigh Portland Cement concrete masonry construction, using portland cement building products in and about the house wherever feasible and in accordance with practical and economical demands.

Hence the Lehigh Prize Homes which have been completed and opened in four cities — New York, Chicago, Kansas City and Birmingham. These houses were built from the first and second prize plans of the Lehigh Portland Cement Home Competition, as shown on following pages.

The Birmingham prize bungalow was the first to be opened to the public. It was started February 22 and completed May 9. Three months after its opening, 10,000 interested homebuilders have inspected it thoroughly.

The Kansas City prize home was started February 26 and completed June 5. At least 13,000 visitors were recorded during the inspection period. The New York City prize home was started February 23 and despite winter building troubles it was completed June 27. The progress of its building was recorded in the New York Tribune as the Tribune Model House No. 5 and 13,000 visitors were recorded between June 27 and July 25.

The Chicago prize home also encountered winter troubles. It was started March 1 and completed July 18. Over 14,000 visitors were recorded between July 25 and August 22.

The purpose of this book is to visualize, for all those who are interested in homebuilding, the actual methods used in concrete masonry construction and the excellent results to be obtained in durability, economy and safety by the use of portland cement.

While concrete masonry construction is completely visualized in the following pages of this book, it is important that the reader shall understand its basic principle. Briefly, this is as follows:

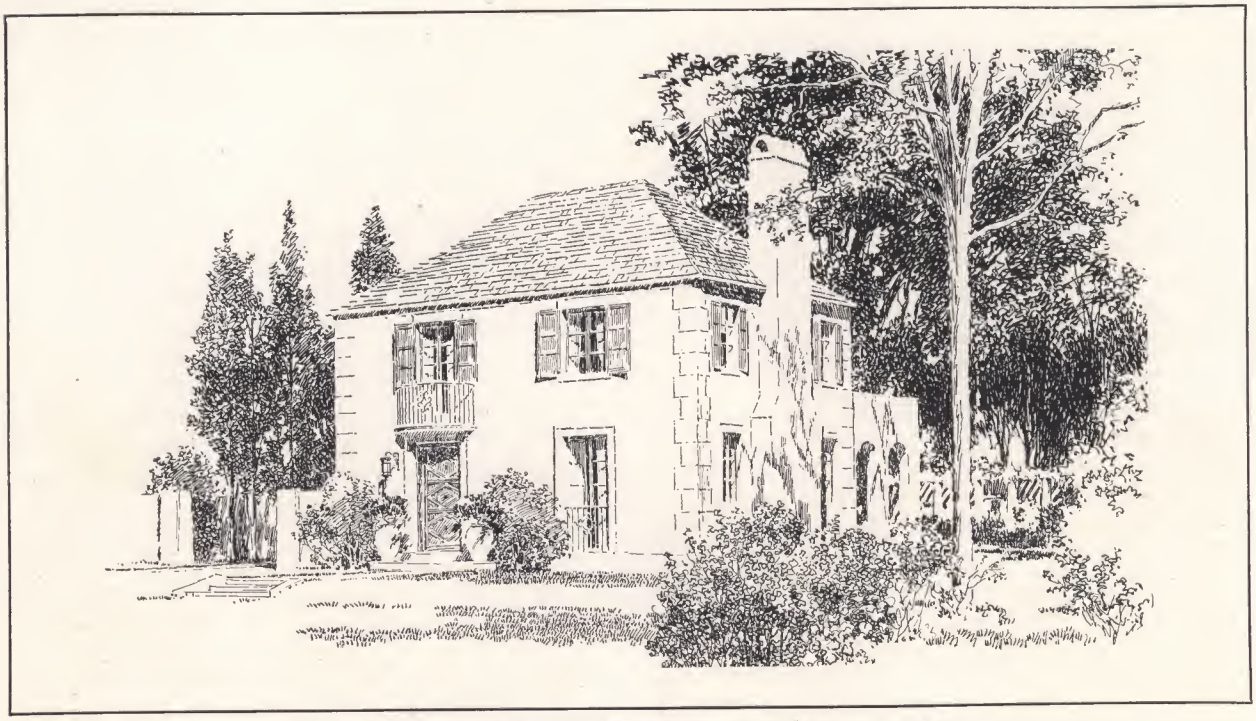
All of the major construction of the dwelling, including those portions exposed to wear, weather, fire and rot, are of an everlasting material which neither deteriorates nor calls for any upkeep after the original investment. The hollow masonry walls insure fire protection and insulation against heat and cold.

* A copy of the book "28 Better Homes" may be obtained by sending 10 cents to Lehigh Portland Cement Co., Allentown, Pa., or Chicago, Ill.

DESIGN FOR THE LEHIGH FIRST PRIZE MODEL HOME

Architect, Angus McD. MacSweeney, San Francisco—Floor Plans Opposite

Built in New York (Bronxville) as Illustrated on Page 17 of This Book



DESIGN FOR THE LEHIGH SECOND PRIZE MODEL HOME

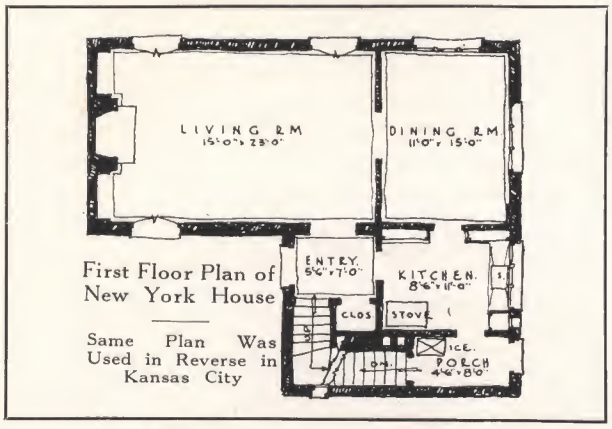
Architect, H. A. Surman, Detroit—Floor Plans on Page 5

Built in Chicago (Winnetka) as Illustrated on Page 19 of This Book

Building Better Homes

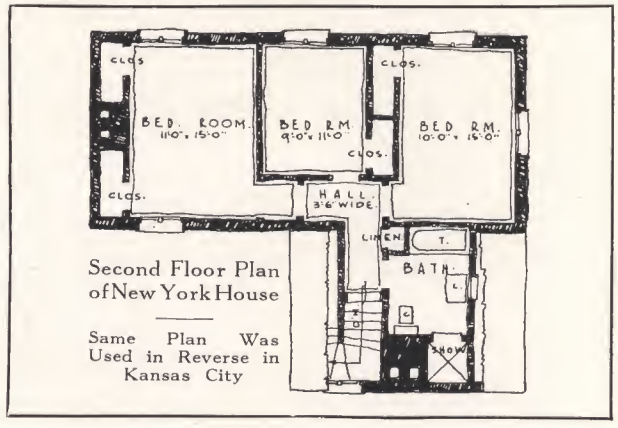
ON Nov. 10, 1925, a jury consisting of five nationally known architects, David Adler, Chicago; Aymar Embury II, New York; Charles G. Loring, Boston; Harrie T. Lindeberg, New York; D. West Barber, Knoxville, Tenn., completed their judgment on the dwelling designs submitted by architectural designers from every part of the United States in the Lehigh Portland Cement Company Prize Home Competition. In addition to architectural merit one of the important considerations in the rendering of the jury's verdict was the practicability of each plan from the viewpoint of concrete masonry construction. The houses selected as prize winners were not only attractive and efficient from an architectural viewpoint but were thoroughly *buildable*.

To prove this fact it was decided by the officials of the Lehigh Portland Cement Company to immediately build four of the prize-winning houses, each in an entirely different geographical location. One



Lehigh Model Home was located in New York City; one in Chicago; one in Kansas City; and the fourth in Birmingham. Thus the demonstration was carried out at four points representing a wide variation in building conditions, comprising in all a cross-section of homebuilding experience which is applicable to similar problems anywhere in America.

The First Prize house, as illustrated herewith, was selected for construction in New York City and the same plan (reversed as shown) was used for the Kansas City Prize Home in order to get a direct comparison of experience. For the Chicago Prize Home it was decided to use the second prize six-



room house as shown. This represents an entirely different type of architecture and of construction details. For Birmingham it was natural to select the first prize bungalow to complete the demonstration.

It was realized that embarking immediately upon the construction of these houses during the winter and spring season would involve seasonal difficulties—but here again was a point to prove—an experiment to demonstrate the practicability of winter building for the concrete masonry house.

Time Required for Completion

"How long will it take to build my house?"

That is one of the first questions which the prospective homebuilder asks and the experience of the Lehigh Prize Homes has answered. Each of the four houses was built under different seasonal, labor and material conditions at costs explained in detail on Pages 37 and 38. Briefly, from the time of start-

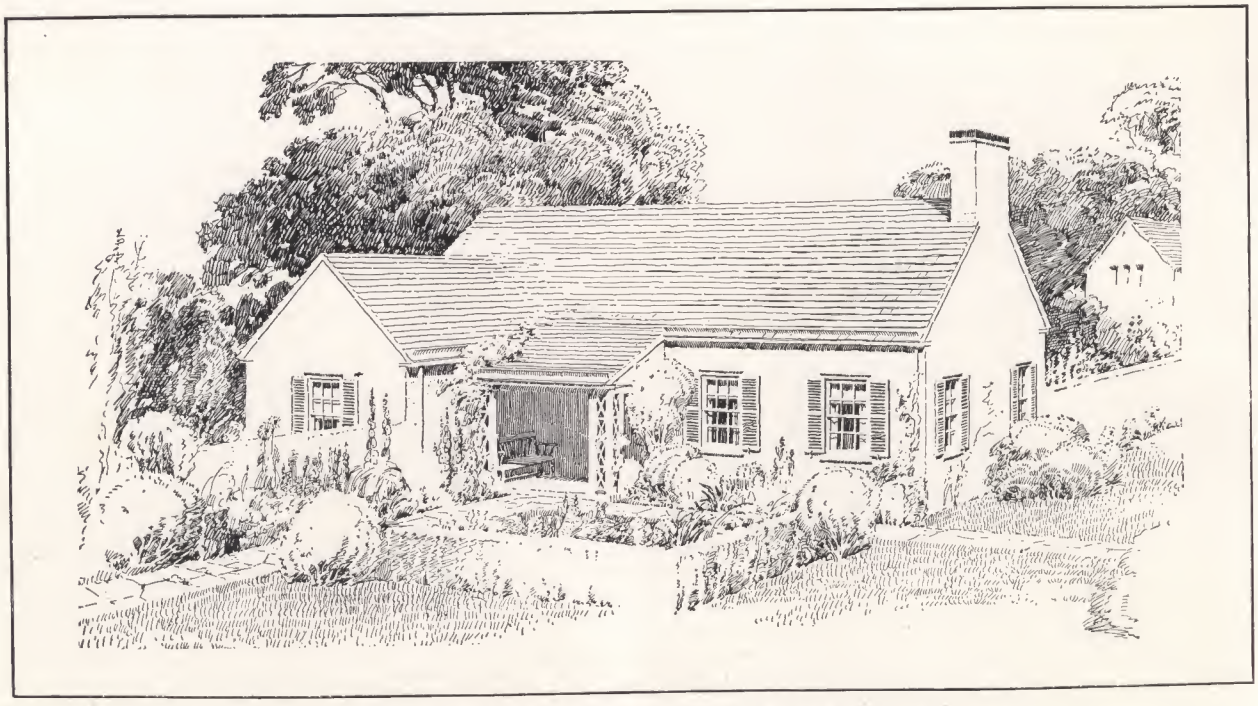
Site of New York House as Building Started

Building Site for the Chicago House

REVERSED DESIGN FOR THE LEHIGH FIRST PRIZE HOME

Architect, Angus McD. McSweeney, San Francisco—for plans see page 3

Built in Kansas City (Country Club District) as Illustrated on page 21

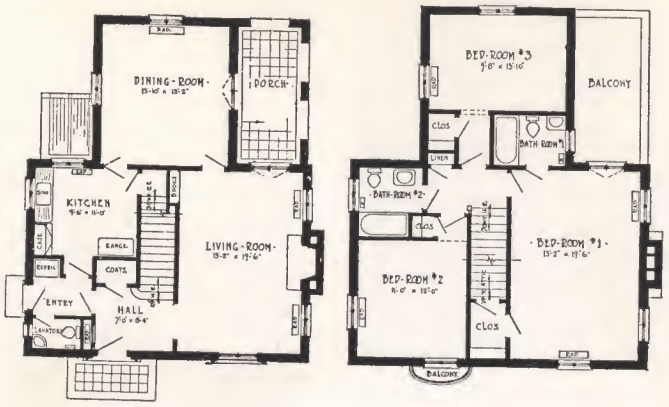


DESIGN FOR THE LEHIGH FIRST PRIZE BUNGALOW

Architects, John Floyd Yewell and Harry Starr, New York City—Plan Opposite

Built in Birmingham (Arlington Place) as Illustrated on Page 23

ing the excavation work until completion the period required for the construction of each house was: New York Lehigh Prize Home 4 months 2 weeks; Chicago Lehigh Prize Home 4 months 2 weeks; Kansas City Lehigh Prize Home 3 months 2 weeks; Birmingham Lehigh Prize Home 2 months 3 weeks.



Plans for the Lehigh Prize Home Built in Chicago
(See Illustration on page 2)

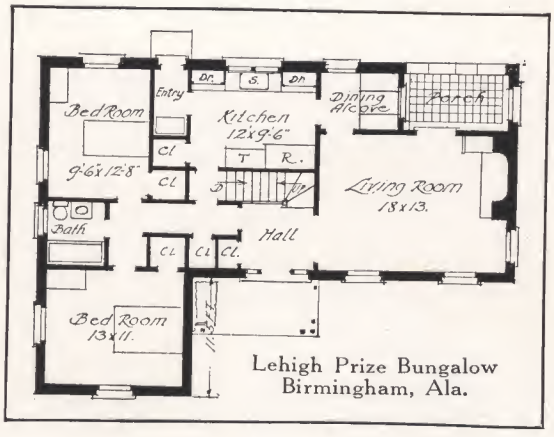
The fact that the building of the homes was a public demonstration introduced certain factors of delay which the average homebuilder would not encounter. These included waiting for photographers at special stages of the work; experimental construction; daily reports and similar details unusual to the average construction job.

Making a fair allowance for these unusual conditions, it is evident that concrete masonry homes such as these can be built under good weather conditions in a period of approximately three months.

Another interesting point which should be brought out here is the feasibility of building in winter weather. Of course, if the weather conditions are too severe it is foolish to attempt construction work; but in average winter weather, such as in the New York and Chicago districts, it seems quite practicable to build. Progress is necessarily slower but costs do not seem to be greater because there is less competition in materials and labor than in the busier seasons of building activity.

Judging by this Lehigh Prize Home experience, the winterbuilding advice for homebuilders seems to be about as follows:

Winter construction, while three weeks slower, nevertheless can proceed steadily toward completion, provided there is not too much frost in the ground to make excavation impractical.



Lehigh Prize Bungalow
Birmingham, Ala.

Excavations for the Cellars

In purchasing the land for each of the Lehigh Prize Homes, care was exercised to make certain that there was little or no rock to be encountered and no springs or soft spots which would make difficult the cellar and foundation construction. Good clay or sandy loam soil makes the best homebuilding site. In spite of precaution, however, a ledge of hard rock was encountered on the Birmingham site, adding considerably to the cost.

The next problem was to determine the size of cellars for each house. It was realized, of course, that the smaller the excavation the smaller the cost. There are

Building Site for Kansas City House

Where the Birmingham House Was Built

Excavation Complete for the New York House and Forms Being Placed for Pouring the Concrete Footings

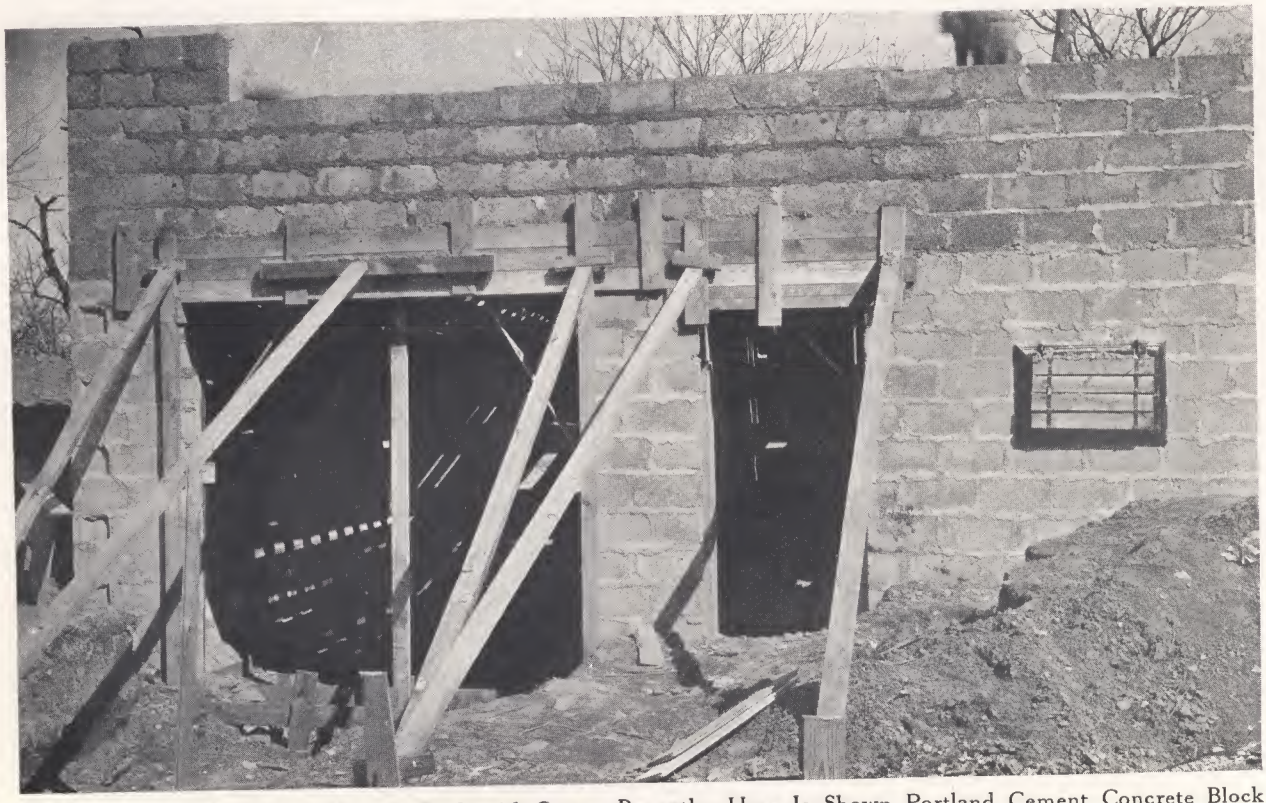
two ways to keep down the size of the excavation. One is to limit the size of cellar space and the other is to establish the grade of the house so that a shallow excavation only is required.

The exact amount of cellar space is determined by several conditions: the owner's wishes; space requirements for the heating plant, storage rooms, laundry, etc.; and the important fact that in colder climates a cellar under the entire house acts as insulation and makes the house warmer and dryer.

For the Birmingham house, in a warmer climate, the cellar was kept small, extending only under the central part of the house. For the other three houses, in colder climates, it was decided to have the cellars the full size of the plan. For the New York house it was also decided to build the garage in the cellar under one wing of the house. As the cellar did not extend completely under the Birmingham house it was necessary also to dig trenches for the foundation footings which are of poured concrete.

Erecting Forms for Pouring Concrete Foundations of the House in Birmingham, Alabama

The final point relative to foundations and excavations was to determine the proper grade level for each house. By the grade of the house is meant simply how high the level of the first floor is established above what is or will be the finished surface



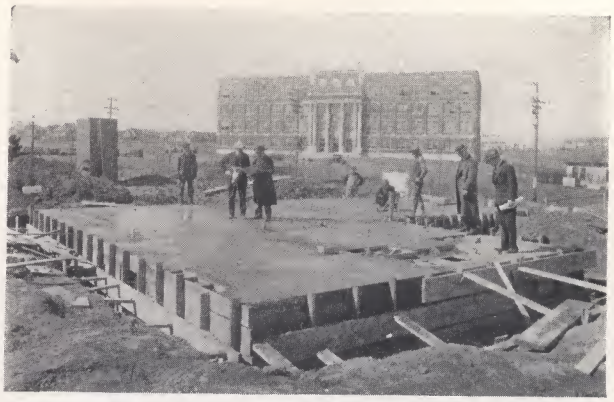
The New York Lehigh Prize Home Is Built with Garage Beneath—Here Is Shown Portland Cement Concrete Block Construction with Forms in Place After Pouring Reinforced Concrete Lintels

of the surrounding yard when the grading of the lot is completed. These grade levels were and always should be determined by the architect because this is a factor of utmost importance in the final appearance of the house. If the house is set too high or too low its proportions may be spoiled and, even

Showing Forms and Reinforcing Ready for Casting a Single Slab Concrete Floor

though well-designed, its appearance may be bad.

In the case of the New York house a lesson of value to homebuilders was learned at considerable cost. When the site was purchased it was ascertained that there was a sewer in the street. It was assumed mistakenly, however, that the level of the sewer was deep enough below the surface to get the



The First Floor of the Kansas City House Is a Single Slab of Reinforced Concrete

proper pitch for drainage from the soil lines in the cellar. Actually this was not true. The sewer was not as deep below the surface as expected, so it became necessary to establish the grade about three feet higher than desired. As a result the entire lot had to be filled and terraced about three feet higher at a cost of several hundred dollars.

Building Foundations and Walls

The structural purpose of foundations is known to all and does not require explanation, but it may not be so clear to the average homebuilder that foundations as a rule cannot simply rest on the earth below but require masonry bases on which to stand.

Starting the Second Story Concrete Block Walls of the Chicago House—Note Simple Construction of Arched Windows—Precast Concrete Quoins for Corner Trim Shown in Foreground

As the concrete tile walls of the Birmingham house go up, the window frames (which in this instance are wood) and the precast concrete sills and lintels are set in position

Lehigh Portland Cement Concrete Construction

As the second story walls of the Kansas City house are started the precast concrete units for the exterior trim of the windows are lifted into position

Birmingham House Ready for Stucco Coats

Chicago House is Shown (left) With Concrete Block Ready for First Stucco Coat and (right) With Scratch (1st) Coat On and Brown (2nd) Coat Being Applied

The bases, with flat top surfaces, mushroom out for greater support about twice the width of the foundation. These are known as footings and are best and most easily built of portland cement concrete poured in forms. Cement, sand and an aggregate of crushed slag or rock are mixed, poured in place and smoothed. This is the first operation in building the house after excavating.

When the concrete footings were in for the four model homes, the next operation was to build the foundations. There are two ways of building a foundation wall of concrete masonry. One is to place wood forms in position and pour solid walls of concrete, after the setting of which the forms are stripped away, leaving the completed foundations resting on the footings. The other way is to build up the foundations of portland cement concrete block or building tile as illustrated.

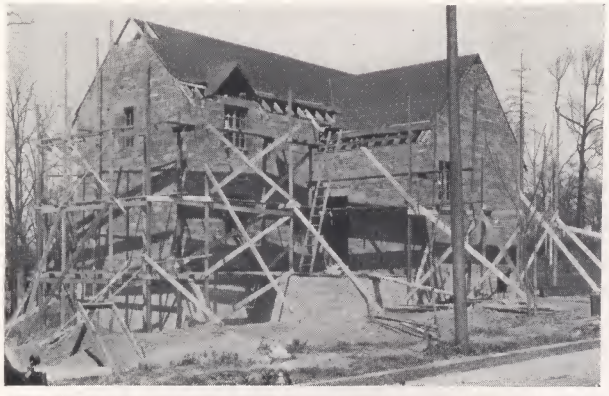
Thus the foundations were built, leaving rough openings for and setting in position the necessary window and door frames as described in a later section of this book. Spaces were also left in the walls for flues, clean-out door and coal chutes. Where bearing partitions were used (a bearing partition is one upon which some of the structure rests) these were built in a similar manner of concrete units.

To keep the cellar dry, concrete drain tile were laid around the outside of the foundation bottoms, connected with the sewer systems, and designed to take off any water which might settle around the house and seep into the cellar causing dampness.

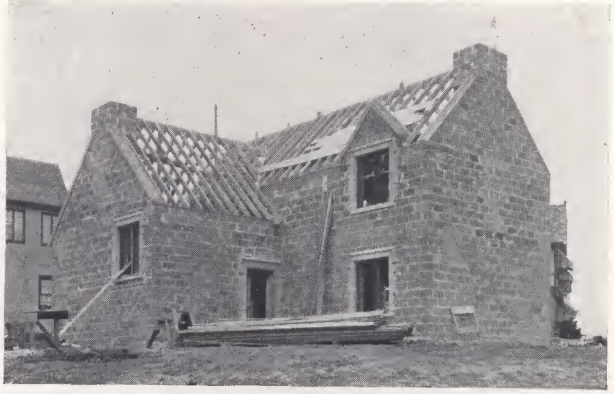
The exterior walls of all houses were built of concrete blocks or concrete building tile made of Lehigh Portland Cement. The accompanying illustrations show this construction in detail. It may be noted that such blocks are not made on the job but are the product of concrete products factories to be found in most localities. This central production insures better standards as the blocks could not well be made on the job because special machinery is required for good results under standardized methods.

Exterior Trim of Concrete Masonry

All of the exterior trim used on the four Lehigh Prize Homes is of portland cement concrete in various forms—either coming to the job as precast units purchased from the same manufacturers who make the concrete blocks and tile, or cast and



New York House with Concrete Block Walls and Scaffolding in Position for Stuccoing



Kansas City House with Concrete Block Walls and Pre-Cast Concrete Trim Set Ready for Stuccoing

Tile Drain at Base of Foundation Will Keep the Cellar Dry

Concrete Block Wall Ready for Setting a Steel Window

Showing Concrete Lintel and Special Blocks Used Above It

moulded on the job. The illustrations tell the story but a brief explanation may make the details easier.

All precast trim is placed in position during the construction of the walls and before stuccoing. On the Birmingham house no finished precast trim was used. The sills and lintels for windows and doors were precast units reinforced with steel bars. These were built into place as the wall went up, extending about two inches from the wall face. They were stuccoed over when the stucco finish coat was put on, making an attractive appearance.

The trim around windows and doors of the Kansas City house came on the job as finished precast portland cement concrete units. (See lower illustration, page 8.) The trim for the Chicago house was also finished precast concrete, including the quoins (decorative blocks used at the ends of the facades—typical of French architecture).

On the New York house the trim was applied differently. The usual concrete structural sills and lintels were set in place. Then, before the finish stucco coat was applied, the trim around windows, doors, etc., was actually moulded in place.

The mouldings were designed by the architect and the correct shape was obtained by the masons through the use of a template (sectional pattern).

Two Methods of Floor Construction

The contruction of the floors in the Birmingham, New York and Chicago model homes was of the usual type of wooden beams and joints illustrated opposite. The joist ends were laid directly on top of the foundation walls—either in slots provided in special joist blocks of concrete or having firestopping of concrete bricks built around the ends as shown.

A very interesting exception was made in the case of the Kansas City house. As shown on Page 7, the entire first floor of the house was cast as one large slab of strongly reinforced portland cement concrete. For this purpose forms were built on top of the foundations, the reinforcing material was placed in position, and the concrete poured.

This operation resulted in a first floor unparalleled by any other form of construction. Such a floor is absolutely firesafe and more soundproof than the usual type. The finished surfacing of the floors

How the Second Floor Joists Are Seated and Spaced—Window Frame Is Placed as the Wall Goes Up

Ends of Floor Joists Protected by Concrete Brick—Note That Wiring Layout Is Now Installed

is described and shown in illustrations on Page 30.

All basement floors were built by laying first a bed of cinders, then a three-inch layer of portland cement concrete and a portland cement finishing coat.

Windows and Doors

All basement windows in each house are of the stock type of steel basement sash now obtainable everywhere at low cost. In the Birmingham house all other windows are of the usual type of wood frame and sash, double hung, except the kitchen windows which are casements. Metal weatherstripping was used throughout all of the prize homes.

In the New York home practically all windows are of the metal casement type, set directly into

A Steel Casement Window Being Set in Place as the Concrete Block Wall Is Built

grooves provided by special concrete block designed for lining the window openings. Portland cement grout was forced into the grooves around the frames and serves to prevent leaks. The Chicago house has similar windows with a mastic waterproofing used for the same purpose of protection from leaks.

For the Kansas City home metal casement windows were used throughout but were set in wood frames and mullions (these are the vertical dividing members of group window openings).

In all cases special concrete blocks were used to furnish a correct setting for the frames of either wood or metal. These specially shaped blocks are available from any concrete block manufacturer.

All of the windows in each house were carefully and permanently screened by the use of copper or monel metal screening which will not rust or deteriorate. For the double hung windows, screens of the usual framed type were employed but the case-

Precast Portland Cement Concrete Trim Used Attractively to Frame a Metal Window

Lining Up the Window Frame—with Precast Portland Cement Concrete Sill in Place

Elastic Cement Waterproofing Is Applied in Setting the Metal Sash as Shown
Lower Picture Shows Wood Window Frame in Place

Lehigh Portland Cement Was Used in the Prize Homes in 40 Different Ways

PORTLAND CEMENT CONCRETE

1. Footings
2. Foundations (poured)
3. Area Walls
4. Steps
5. Porch Floors
6. Terrace Floors
7. Cellar Floors
8. Garage Floors
9. First Floor (Slab)
10. Lintels (Cast on Job)
11. Sills (Cast on Job)
12. Exterior Trim (Moulded)
13. Firestopping
14. Chimney Tops (Cast)
15. Driveways
16. Walks
17. Garden Walls (Cast)
18. Sub-Floors

CONCRETE BLOCK AND BUILDING TILE

19. Foundations
20. Walls
21. Chimneys
22. Partitions
23. Firestopping
24. Garden Walls

STUCCO AND PLASTER

25. Stucco Mixed on Job
26. Prepared Stucco
27. Stuccoed Trim
28. Decorative Plaster

PRECAST PORTLAND CEMENT BUILDING UNITS

29. Roofing Tile
30. Cement Asbestos Shingles
31. Door and Window Trim
32. Sills and Lintels
33. Hearths
34. Mantels
35. Quoins
36. Chimney Tops, Etc.
37. Flue Lining
38. Drain Tile
39. Tile Floors
40. Garden Furniture

ment windows offered a different problem—one which the homebuilder often solves incorrectly. Two methods were used for screening the casements, the problem of course being to provide a form of screen which would allow easy access to the operation of the window without removing the screen each time. The two methods were, first, the use of a rolling type of screen which operates easily in a manner similar to a window shade. This type of screen needs no winter removal, as it stays in its roller case above the window, being thus protected from the weather but always ready for use. The second method is to use strongly framed screens hinged at the top and swinging up and in for access to the casements. The latter is the less expensive method

The doors were all of wood in stock patterns with iron or brass hardware selected to meet the architectural requirements of the various exteriors. Screen doors with copper mesh were installed.

Building the Roofs

The prospective homebuilder will find much of interest in the various methods used for the construction and surfacing of the roofs of the four Lehigh Prize Homes. Here again portland cement concrete products play an important role and in order to bring out the various points of interest a brief description is given covering the roofing of each house. On these pages will be found several illustrations

The Roof of the Lehigh Prize Bungalow in Birmingham Is Covered with the Spanish Mission Type of Portland Cement Concrete Roofing Tile Over Wood Sheathing, Building Paper and Furring Strips

On the Kansas City House the Roof Is of Tapered Cement-Asbestos Shingles in Random Widths and Gray Color Tones—Note That Chimney and Window Trim Are Precast Units

which indicate clearly how this work was done.

Up to and including the sheathing (board covering over the rafters), the supporting framework for each roof was built in practically the same manner as follows:

When the concrete block (or concrete building tile) exterior side walls and the second floor partitions were brought to their finished height they were topped off with heavy wood beams 3″ x 8″ and known as roof plates. These were bolted securely in position. These plates, together with the strong masonry gable walls, formed a complete base for the framing of the roof, which is always carried out before the stucco is applied.

The roof rafters were then erected as shown, details such as the eave construction shown on Page 14 were carried out, and the entire roof covered with sheathing. From this point on there were variations in methods and materials.

In building the roof of the Birmingham home the sheathing was first covered with a layer of asphalt felt after which wood strips, 1″ x 2″, were laid vertically and horizontally as shown on Page 12. The roofing material used was portland cement concrete roof tile manufactured by a local concrete products company using Lehigh Portland Cement. These tile are red in color and were simply hung in position on the wood strips, lapped to keep out wind and water. Copper flashings (joint protection around vents, chimneys and valleys) were placed before the tile were laid. Gutters and downspouts were of galvanized steel.

For the Kansas City roof a layer of asphalt felt was nailed with copper nails to the sheathing. The roofing material selected was asbestos cement shingles 24″ long and of random widths from 6″ to 12″. These shingles, made of a mixture of Lehigh Portland Cement and asbestos, are of the tapered type, meaning that the butts (lower ends) are thick, tapering to a thin edge at the top. The purpose of this is to get heavy shadow lines, making the roof more interesting in its appearance of texture. That also is the reason for having random widths.

The colors of these shingles were selected in two tones of grey, light and dark, the lighter colors being blended near the ridge top and the darker near the eaves, giving an old English cottage effect as though the rains of years had washed the dust and dirt down to the lower parts of the roof. These shingles were nailed on with copper nails, about 7½ inches of each shingle being exposed as shown in the illustration. The flashings, gutters and downspouts are of zinc.

On the New York house a different type of cement asbestos shingles were used although made by the same manufacturer. These are not tapered but flat shingles 8″ x 16″ in size and laid in regular courses with 6″ exposures. They are red, yellow and brown in color. The method of laying is simi-

Here Is Shown the Method Used for Constructing the Eaves

—and Here the Portland Cement-Asbestos Shingles Are Being Laid

Finished Roof with Work in Place for the False Chimney

lar to that used for the Kansas City home as already described. For this house, all sheet metal work (flashings, gutters, down-spouts, leaders, etc.) was of zinc, a material which is unaffected by rust or deterioration and requires no maintenance cost, a characteristic also of copper products.

The roofing of the Chicago house was carried out in the same manner as that of the Birmingham home already described. The sheet metal work in this case is also of zinc with roof of concrete tile.

The practicability of portland cement products in the form of concrete roofing tile or cement asbestos shingles should be obvious to the prospective home-builder. In concrete roofing tile various shapes, French, Spanish Mission and flat tile, are available. Special colors may be had by specification, and stock colors in reds, greens and buffs are quite usual. Cement asbestos shingles are available in various colors and sizes and in both the flat and tapered forms. Thus the portland cement roofing materials meet all architectural requirements; need no painting or other maintenance expense; are absolutely fire-safe; and will last the lifetime of the building.

Porches and Terraces

Three types of porches were used in the construction of the Lehigh Prize Homes. The extension porch, the recessed porch, and the open porch which is more appropriately termed a terrace. The extension porches were built with concrete block foundations, lintels of reinforced concrete, and structural floors consisting of solid six-inch concrete slabs reinforced with steel rods. Stairs are also of reinforced concrete on proper footings. Recessed porches are within the main perimeter of the house. Terraces were built with a single reinforced concrete slab laid on footings of poured concrete.

The surface finish of all porch floors is either of concrete tile in red or buff and usually coated with a waterproof varnish to enrich the coloring and make

Ridge-Roll to Complete a Roof of Portland Cement Roofing Tile

Portland Cement Mission-Type Roofing Tile in Position

The Construction and Roofing of a Typical Stuccoed Dormer

cleaning easier; or a finished surface of granolithic portland cement concrete in the desired color was smoothed on and marked off to provide a tiled effect. Roofs of extension porches were finished in the same manner as the main roofs and over the open terraces attractive awnings were stretched for comfort and to improve the general architectural appearance of the building by introducing color spots.

Chimney Types and Construction

All chimneys were constructed of portland cement concrete blocks or building tile with standard flues and concrete brick used for filling. The chimney of the Birmingham house has two separate flues, one 8″ x 12″ opening for the furnace; and one 15″ x 15″ opening for the fireplace. (The area of the flue should be 10% that of the fireplace opening in order to provide proper draught). Chimney construction was carried on along with that of the superstructure walls. All chimneys carry their own dead weight, resting either on solid rock or on heavy concrete footing. This is a very important point because if the chimney settles innumerable plaster cracks will result.

The exteriors of all chimneys were finished in stucco. The decorative chimney pots, caps, etc., were mainly obtained as finished precast concrete units purchased from local concrete products manufacturers using Lehigh Portland Cement.

Another very interesting point is that on the New York home one of the two chimneys is what is known as a false chimney. The false chimney is quite commonly used where the architectural design calls for more chimneys than the practical needs of the building may demand. The false chimney is a purely decorative detail except that it affords a convenient screen for the outlet of the vent pipes from the plumbing system.

Applying the Portland Cement Stucco

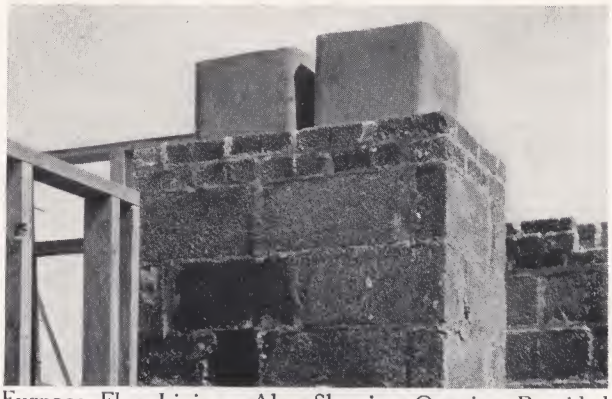
The best explanation which can be given to cover the various operations involved in the application of portland cement stucco is to be found in the progress pictures shown on Pages 24 and 26 of this book. These are from photographs of actual stages of the work on the Lehigh Prize Homes and show fully how a first class stucco job is carried out. The finished textures of the four houses are shown on Page 26. The color effects are indicated in the full colored illustrations on Pages 17 to 23 of this book.

Each of the stucco jobs was carried out in what is known as three coat work which good construction practice requires. Of course many stucco jobs are done in two coat work for the sake of economy but this is not good practice and often results in cracks.

The first, or as it is usually termed, the *scratch*

(*Continued on page 25*)

Chimney Construction at the Second Floor—Note Concrete Block and Flue-Lining



Furnace Flue Lining—Also Showing Opening Provided for the Kitchen Range Vent

Above—Placing Precast Concrete Chimney Tops
Below—Flat Chimney Top of Concrete Cast on Job

GABLE END DETAIL OF THE NEW YORK LEHIGH PRIZE HOME

PREPARED PORTLAND CEMENT STUCCO IN RUBBLE TEXTURE ON WALLS OF PORTLAND CEMENT CONCRETE BLOCKS

LEHIGH FIRST PRIZE CONCRETE MASONRY HOME

BUILT IN BRONXVILLE, NEW YORK

Architect, Angus McD. McSweeney, San Francisco Supervising Architect, Leland H. Lyon, New York

Contractor, J. L. Stoltz, Bronxville, New York

Rear Elevation Showing the Location of the Built-In Garage

ENTRANCE DETAIL OF THE CHICAGO LEHIGH PRIZE HOME

STUCCO IN ROUGH FRENCH TEXTURE ON WALLS OF PORTLAND CEMENT CONCRETE BLOCKS

LEHIGH SECOND PRIZE CONCRETE MASONRY HOME

BUILT IN WINNETKA, CHICAGO

Architect, H. A. Surman, Detroit

Supervising Architects, Granger and Bollenbacher, Chicago

Contractor, Paul F. P. Mueller & Son, Chicago

Rear Elevation Showing Terrace with Double Approach

GABLE END DETAIL OF THE KANSAS CITY LEHIGH PRIZE HOME

BUFF STUCCO IN ENGLISH TEXTURE ON WALLS OF PORTLAND CEMENT CONCRETE BLOCKS

LEHIGH FIRST PRIZE CONCRETE MASONRY HOME

BUILT IN COUNTRY CLUB DISTRICT, KANSAS CITY

Architect, Angus McD. McSweeney, San Francisco Supervising Architects, Buckley & Van Brunt, Kansas City

Contractor, Joseph F. Gier, Kansas City

Perspective View of Rear Illuminated for Display at Night

LIVING ROOM END OF THE BIRMINGHAM LEHIGH PRIZE HOME

SHOWING FINISHING STAGE IN BUILDING THE BUNGALOW AND GARAGE

LEHIGH FIRST PRIZE CONCRETE MASONRY BUNGALOW

BUILT IN BIRMINGHAM, ALABAMA

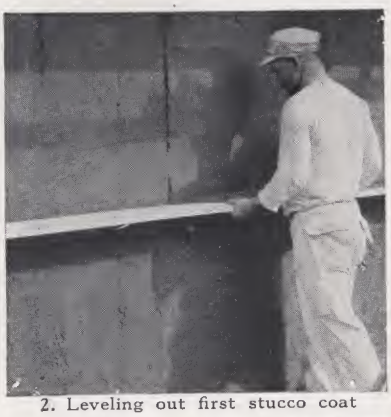
Architects, John Floyd Yewell and Harry Starr, New York Supervising Architect, Geo. P. Turner, Birmingham
Contractor, E. R. Maynord, Ensley, Alabama

Rear Elevation Showing Recessed Porch

A Graphic Description of the Proper Application of Stucco

A series of photographs of actual work on the Kansas City Lehigh Prize Home showing how Lehigh Portland Cement stucco is applied over concrete block walls

1. Applying first stucco coat

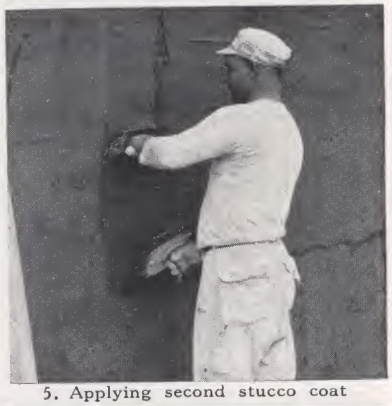


2. Leveling out first stucco coat

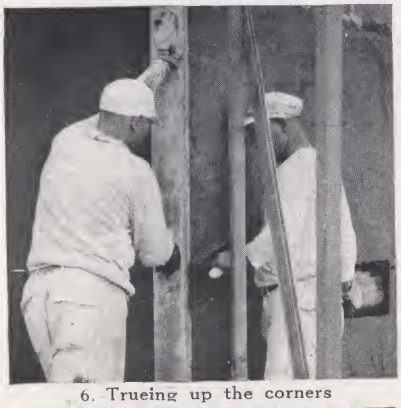
3. Dry float for first coat

4. Finish float for first coat

11. Texture of the finished wall



5. Applying second stucco coat

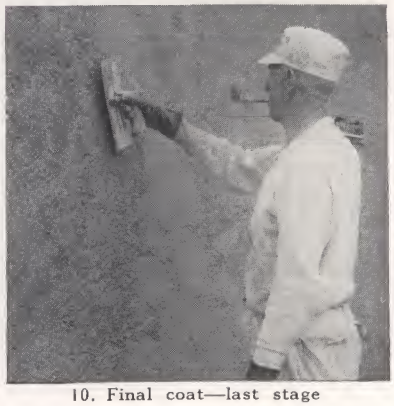


6. Trueing up the corners

7. Final coat—first stage

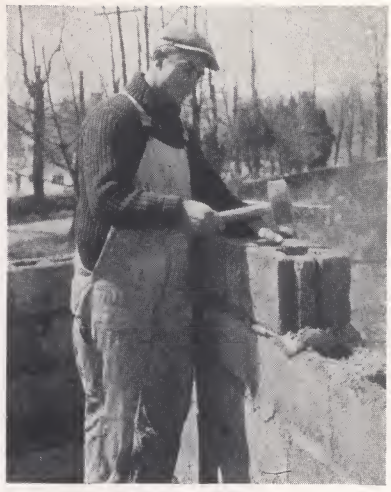
8. Final coat—second stage

9. Final coat—third stage



10. Final coat—last stage





The Laying of Lehigh Portland Cement Concrete Block

1. Spreading the Mortar 2. Pressing Block Into Position 3. Tapping Block Into Line

(*Continued from page 15*)

coat of stucco was applied directly on the concrete block walls which have a rough surface to provide a strong bond. This was rapidly followed by the second or *brown coat* which was allowed to set as long as possible before the final or *finish coat.*

It is of course in the finish coat that both the color and the texture of stuccoed surfaces is obtained. Perhaps at this point it will be well to explain that there are several distinct methods of obtaining various shades and mixtures of color in portland cement stucco work; these are explained in the following paragraphs which are presented in order of cost.

Colored Stuccos Using Grey Cement

Using this method care must be taken to see that the various ingredients are properly proportioned and exactly duplicated in each batch of material to preclude possibility of color variation on the wall of the house. Workmen must be impressed with this essential point if good work is to result. This is the most economical type of colored or grey stucco work.

The texture desired is worked into the finish coat which may well be lightened by using marble dust or white sand as an aggregate with the grey cement. Two tones in the finished work are easily obtained by incorporating a color into this finish coat to be followed by a waterproof cement paint in a contrasting color, so applied as to permit the base material to show through in a random pattern.

Prepared Portland Cement Stucco

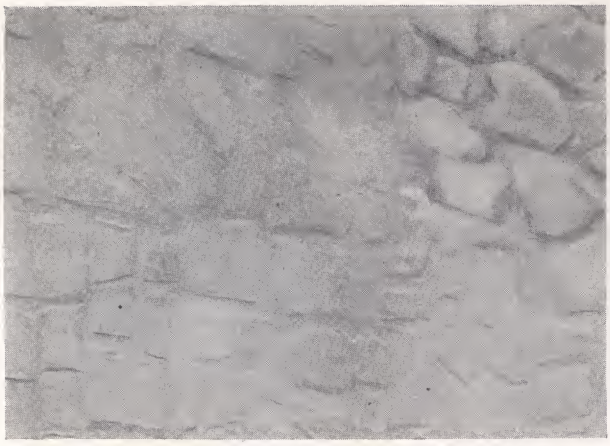
The use of portland cement stucco has increased very rapidly during the past few years, and it is undoubtedly due to this fact that prepared or premixed portland cement stuccos have come into such general use. In localities where expert workmen are not readily available this material solves the problem of correct mixture of materials and leaves

(*Continued on page 27*)

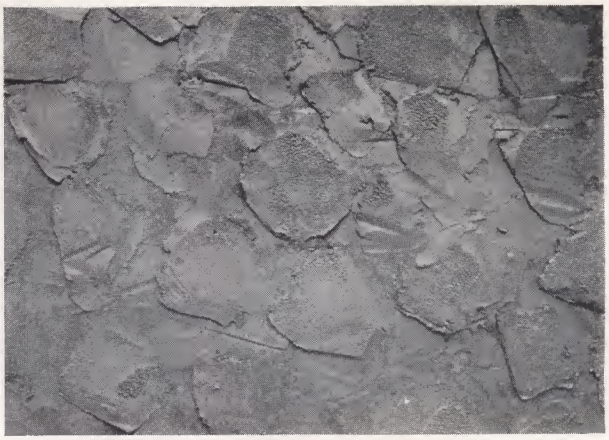

Erecting Concrete Block with Precast Trim Around Openings


Note Strength of Precast Concrete Lintel Shown in Position


Placing and Levelling a Precast Portland Cement Concrete Sill



New York House Finished in English Rubble Pattern



Rough French Stucco Finish on the Chicago House

Details of Lehigh Portland Cement Stuccoing

(Views of actual work on the Lehigh Model Homes)

First step in obtaining rough texture for finish coat of Birmingham bungalow

Light trowelling gives Italian stucco effect used on the Birmingham bungalow

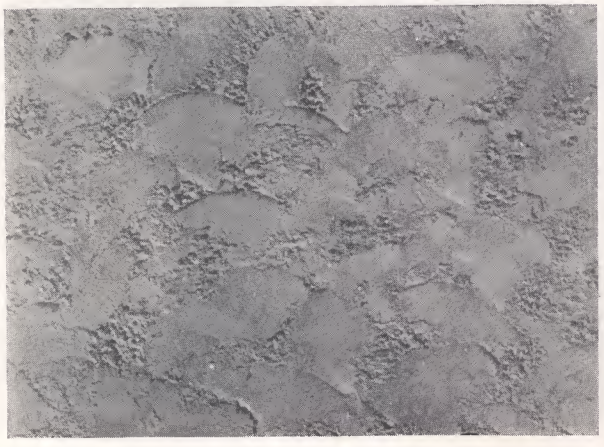
Concrete block masonry wall ready for the application of stucco

Scratching the first coat of stucco on the Bronxville home

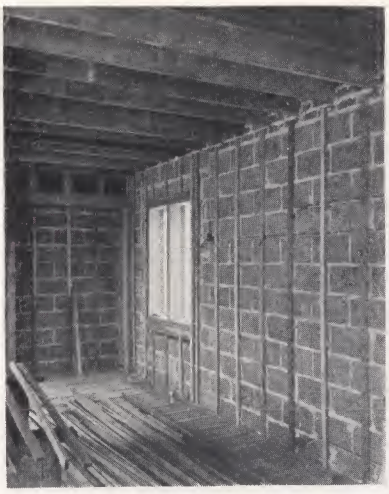
The scratch (first) coat supplies a strong adhesive surface

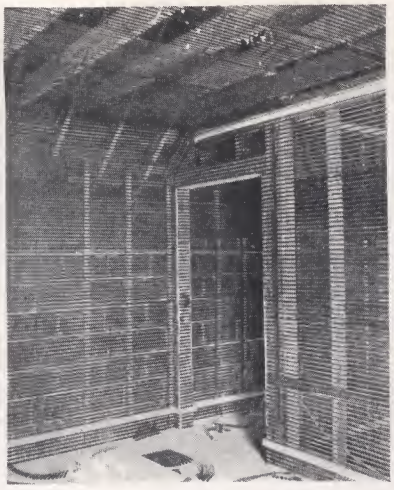
—and then the second coat goes on, adhering firmly at all points

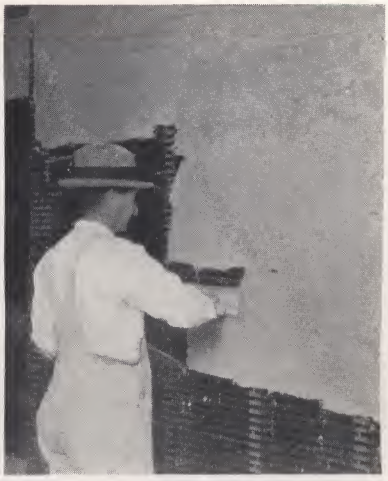
English Stucco Texture on Kansas City House



Italian Stucco Texture on Birmingham Bungalow







Interior Plastering for Portland Cement Concrete Masonry

1. Wood Furring Strips in Place 2. Metal Lath Applied Throughout 3. Applying the Plaster Coat

only the application of the material and the development of texture in the hands of the local workmen. Consistency of shade or color is an important item and in the use of prepared stuccos this problem is satisfactorily solved.

The Lehigh Prize Homes were stuccoed as follows:
New York—Buff, pre-mixed portland cement stucco.
Chicago—Brown, portland cement stucco.
Kansas City—Light buff, portland cement stucco.
Birmingham—Buff, cement paint over stucco.

Which method can be recommended to the homebuilder? Only the test of time can bring out this phase of the Lehigh experiment in homebuilding. Each method has its advantage either in economy, simplified workmanship or more certain results. The only reply to this question today is the following combination—the advice and supervision of an experienced architect; the employment of an experienced stucco contractor; and the use of a good portland cement and good colors. The contractor should and will lay up test panels to show texture and color.

Interior Plastering and Partitions

In building the model homes, all of the partitions on the first and second floors were built of studs, lath and plaster. Metal lath was nailed on the upright studs throughout and the plaster coats applied, not only providing reasonably firesafe walls but insuring the rooms against plaster cracks.

Ceilings were similarly constructed, using metal lath as a base for the plaster. On the inside of the concrete block exterior walls, as shown in the illustrations, wood furring strips were attached for the purpose of nailing on the metal lath. This construction provides a dead air space which eliminates all condensation or dampness on the inside of all exterior walls. Thus all walls and ceilings were made

(*Continued on page 30*)

4. Plaster Adheres to Metal Lath With Innumerable Strong Keys

Portland Cement Concrete Fireplace Construction

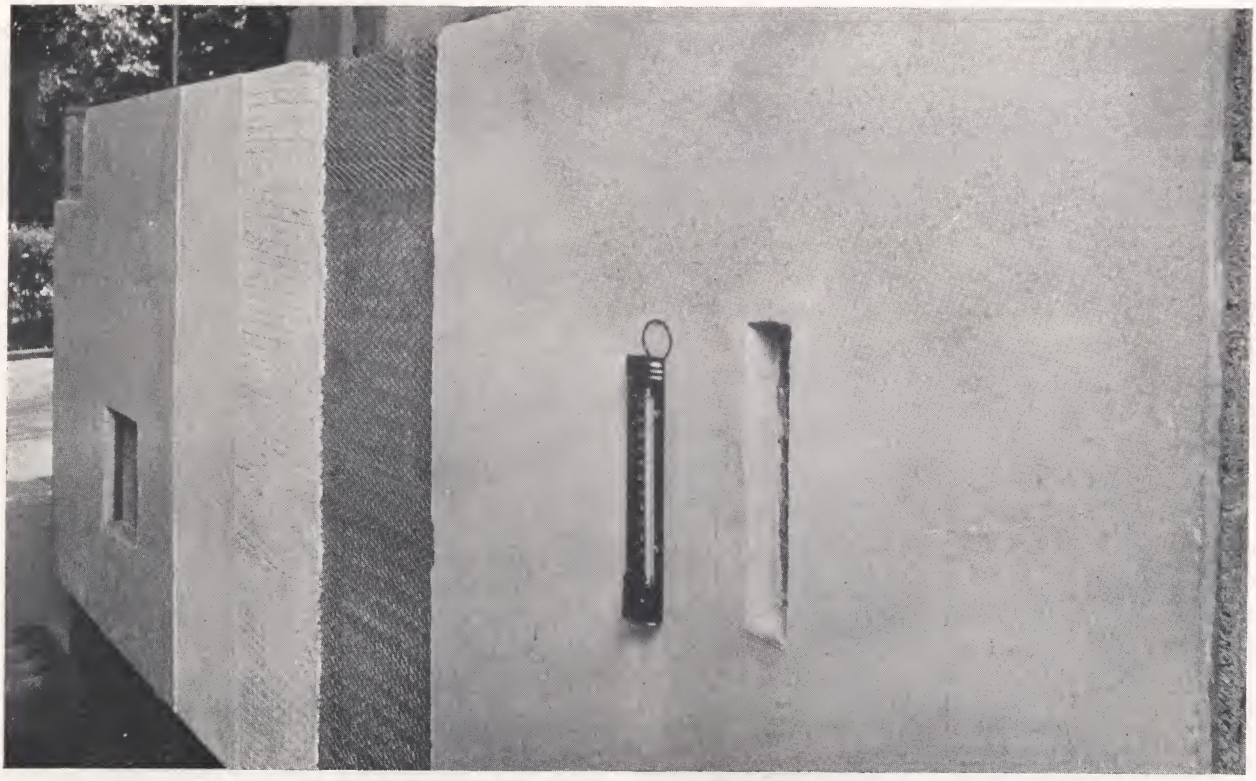
Rough Opening—Finished with precast concrete mantel and facing

Lehigh Prize Bungalow in Birmingham Ready for Grading and Planting

Lehigh Prize Home in Chicago Ready for Finishing Touches

Concrete Masonry Wall Withstands Fire and Water Test

Demonstration wall which successfully overcame the effects of 200° of heat applied by an electric heater encased in glass against one section, and a constant stream of water pouring down another section. No evidence of checking, spalling, cracking or dampness was observed after the test



Reverse side of the same wall—only 70° of heat recorded and no sign of moisture showed through stucco

Living Room in New York Home

Dining Room in New York Home

ready for plastering, which was carried out in the usual three-coat work as shown.

Finishing the Interiors

The interior finishes of the various rooms in the model homes are quite diversified in character and of excellent quality throughout. All floors of principal rooms are finished in hardwood, either oak or maple, and most of the bedrooms similarly. The bedroom walls are papered in attractive designs or painted in soft-toned stippled finishes. All interior painted trim is selected pine or poplar. All natural grained trim is of chestnut, gumwood or oak.

The walls of living room, dining room and hall in the New York house are of portland cement plaster throughout. The finish coat being a portland cement product developed by the manufacturer of the exterior prepared stucco previously described.

In Kansas City a rough texture was obtained with lime plaster which was later treated with oils and flint colors to give a soft, antique tone, accentuated by a final coat of glaze.

Beautiful tones were obtained on the first floor walls of the Chicago home by applying a portland cement interior material over two coats of plaster. Competent workmen developed a very pleasing texture which added greatly to the beauty of the entire house. All natural grain trim in these rooms was of chestnut, gumwood or oak.

The chimney-pieces are entirely constructed and finished with portland cement concrete products. All mantels shown in the various illustrations, together with fireplace facings, were precast units purchased from concrete products manufacturers and finished on the jobs in antique effects. Hearths were paved with portland cement concrete tile in buff or red.

Kitchens and Bathrooms

These important rooms were very carefully planned, finished and equipped in each of the Lehigh Prize Homes. The floors are of rubber tile or linoleum in attractive tile patterns. The walls are tiled with glazed white tile to a height of approximately five feet, the upper portions being enameled. Considerable use was made of built-in equipment such as ironing-boards which fold into wall closets; broom closets; dressers; kitchen cabinets and breakfast nook benches and tables, all purchased from stock equipment and finished after installation.

Kitchen sinks and drains are in porcelain finish

Below Are Shown the Dining Room and Living Room in the Chicago Home

Living and Dining Rooms—Kansas City Home

Typical Bedroom—Kansas City Home

(the laundry equipment is located in the basement).

The heating equipment for the four homes was of the steam or hot-water type. This included boilers, radiators and fittings in connection therewith. A hot-water heating system was installed in the New York and Chicago houses, and a one-pipe steam system in Birmingham and Kansas City. The capacity of these boilers ranged from 900 to 1,000 square feet. Several types of radiators were used, their installation as to type being governed by the architectural layout of the rooms in which they were erected.

Electrical Equipment

Standard systems of electric wiring were used throughout in all the houses. Where concrete slab work was done as in the Kansas City house, such wiring was encased in pipe conduit. All other wiring was covered with flexible B.X. conduit. This type of wiring installation added greatly to the fire safety feature of the houses as well as appearances. Sufficient outlets and switches were provided to meet all modern lighting and heating requirements. The schedule in this connection ran approximately as follows: Ceiling, including closets, etc., 25. Wall brackets, 20. Convenience outlets such as base plugs, etc., 19. One-way switches, 18, and three-way switches, 8. A ceiling fixture was installed in the dining room only, the balance of the house being lighted by wall brackets, with base plugs provided for floor lamps. Provisions were made, however, for ceiling fixtures in the rest of the house.

Garages, Drives, Walls and Walks

The illustrations on the next page show the types of garages for each house. For the New York home the garage was located in the cellar, separated by concrete block fire-walls in accordance with insurance underwriting requirements. The other garages are independent buildings entirely constructed in portland cement concrete masonry.

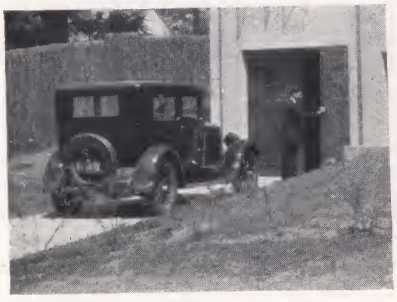
All walks and drives are of two-course concrete construction, heavy bed-courses 3½ to 5½ inches thick being first laid and topped with a ¾-inch finish coat of smooth portland cement. Garden walls and accessories are of concrete masonry construction.

After final grading all of the plots were carefully landscaped by experts, using a varied selection of decorative trees and shrubbery as shown in the illustrations of the finished Lehigh Prize Homes of portland cement concrete masonry. (Pages 17-23).

Below Are Shown the Living Room and Kitchen of the Birmingham Bungalow

Rear View—New York Prize Home

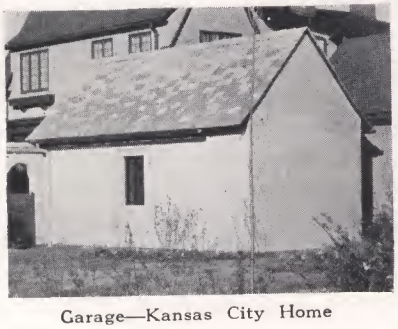
Rear View—Chicago Prize Home



Garage Under New York Home

Laying a Poured Cement Floor

Garage—Chicago Home



Garage—Kansas City Home

Laying a Cement Tile Floor

Garage—Birmingham Home

Rear of Kansas City Home

Rear of Birmingham Bungalow

Specifications for the Four Lehigh Prize Homes

FOR the purpose of completing the descriptions of the four Lehigh concrete masonry homes which are presented in this book there will be found on this, and the following two pages, outline specifications which will serve to indicate the type of all materials, equipment and architectural accessories used in the process of construction. Those who are interested in knowing the quantities of materials used are referred to the tabulation on Page 36. Cost figures are presented on pages 37 and 38.

Beginning with the sound precedent of good portland cement concrete masonry construction, every effort was made to select consistently high grade materials and equipment for these houses The construction throughout may well be termed of the highest class, though at no time in the selection of materials or methods was the fact overlooked that the original investment must be reasonably conserved. Certainly, the houses could have been built more cheaply —but here will be no invasion of rot, rust or rapid disintegration to set up a high annual cost of maintenance and replacements. The marks of high quality construction are to be found not only in the use of good masonry materials but in the selection of copper and zinc for exposed metal work; metal lath throughout the houses; standard approved electric wiring systems; and the better grades of plumbing, heating and built-in equipment.

New York Home with Planting Complete

The Lehigh Prize Homes, as a consequence of good specifications, will be functioning as though built yesterday — when many speculative dwellings and those built under the impulses of false economy have, through deterioration, become eyesores to the neighborhood and burdens to those who own them.

Outline Specifications for the New York Home

Surveying, Excavation, and Backfilling
Staking out and clearing trees. Excavation under entire house. Trenches for gas, sewer and water and backfilling.

Basement and Foundations
Footings, drains, concrete block for the outside and partition walls, concrete basement floor, concrete block areas.

Concrete Masonry Superstructure
Concrete block for the walls, chimney and fireplace, including the precast concrete mantel.

Carpentry and Millwork
Includes rough lumber for floors, interior partitions, and roof framing. Exterior and interior trim, wood doors and frames. Labor of setting steel sash, mortising locks, etc., weather strips.

Reinforced Concrete Floor Slabs
None

Steel Window Sash
All windows.

Stucco
Two undercoats and one decorative coat of Portland Cement Stucco over entire outside surface.

Glazing
Placing glass in all windows and doors.

Lath and Plaster
Metal lath throughout. Hardwall plaster upstairs. Downstairs, three coats of Portland Cement plaster.

Roofing and Sheet Metal Work
Cement asbestos shingles. Zinc flashing, gutters and downspouts.

Finish Hardware and Ironwork
Finish hardware for doors, anchor bolts-porch railing, coal chute, cleanout door, dampers and ash dump for the fireplace.

Tile Work
Glazed tile for bathroom and kitchen walls and window sills. Rubber floor tile for bathroom and kitchen.

Hardwood Floors
Clear, select white oak downstairs, clear select maple upstairs, cement composition tile in front hall.

Plumbing Fixtures and Installation
Tub, stool, lavatory and shower upstairs, stool and lavatory in basement, double drain-board sink in kitchen, all of porcelain enamelware. Galvanized iron sink in garage, brass piping, laundry tubs.

Concrete Trim Around Windows and Doors
Precast concrete lintels, monolithic poured concrete sills. Mouldings of Portland Cement Stucco.

Quoins—Precast Concrete
None

Electric Wiring and Fixtures
Wiring in cable conduits, two and three way tumbler switches. Thirty-five fixtures and lamps.

Heating and Radiation
Hot water heating system with automatic heat regulators. Automatic gas water heater.

Painting and Decorating
Upstairs, wall paper in bedrooms; three coats lead in oil on woodwork. Downstairs, waxed chestnut brown stain on the woodwork. Walls of tan colored Portland Cement plaster, waxing and shellacking hardwood floors.

Screens
Rolling screens on interior of all steel casement windows. Screened doors for all exterior doors.

Cabinets
Steel kitchen cabinets in kitchen, medicine cabinet in bathroom.

Legal Fees and Mortgages, etc.
Commission retained by company making first mortgage loan.

Walks, Steps, Terraces
Flagstone walk for front and rear entrance. Red tile marked granolithic concrete surface on front terrace. Rear entrance terrace of natural cement color.

Garage
One-car garage incorporated in the house construction.

Driveway
Portland Cement concrete driveway.

Landscaping
Hedge at sidewalk line around entire property. A hedge placed concentrically on front lawn enclosing space for flower garden. Trees and shrubs placed attractively around the lawn.

Outline Specifications for the Chicago Home

Surveying, Excavation, and Backfilling
Surveying, staking out, removal of trees, excavation under entire house. Trenches for gas, sewer and water and backfilling.

Basement and Foundations
Footings, drains, concrete block basement and partition walls, concrete basement floor.

Concrete Masonry Superstructure
Concrete block for exterior walls, chimney and fireplace and areas. Precast units for fireplace mantel and hearth.

Carpentry and Millwork
Rough lumber for floors, partitions and roof framing. Exterior and interior trim, wood doors and frames. Labor of setting steel sash, weather strips and mortising locks, etc.

Reinforced Concrete Floor Slabs
None.

Steel Window Sash
All windows.

Stucco
Two undercoats and one decorative coat of Portland Cement Stucco over entire outside surface.

Glazing
All windows and doors.

Lath and Plaster
Metal lath throughout. Hardwall plaster upstairs. Portland Cement plaster downstairs.

Roofing and Sheet Metal Work
Red concrete roof tile (French type). Zinc flashing, gutters, and downspouts.

Finish Hardware and Ironwork
Finished hardware for doors. Reinforcing rods, iron grills and gratings.

Tile Work
Concrete floor tile for bathrooms. Linoleum for kitchen floor.

Hardwood Floors
Clear select white oak flooring throughout, except in bathrooms and kitchen.

Plumbing Fixtures and Installations
Tub, stool and lavatory in two bathrooms upstairs, stool and lavatory downstairs, sink in kitchen, all of porcelain enamelware. Concrete laundry tubs in basement, brass piping.

Concrete Trim at Windows and Doors
Precast concrete sills. Moulding of Portland Cement Stucco.

Quoins—precast Concrete
Portland Cement precast concrete quoins on four exposed corners of the building.

Electric Wiring and Fixtures
A wiring system conforming to the specifications of the National Board of Fire Underwriters. Complete line of fixtures.

Heating and Radiation
Hot water oil burning heating system with automatic heat regulation. Automatic gas water heater.

Painting and Decorating
Upstairs, wall paper in bedrooms; three coats of lead in oil on woodwork. Downstairs, waxed stain on woodwork. Waxing and shellacking hardwood floors.

Screens
Rolling screens on inside of all steel casement windows. Screened doors for all exterior doors.

Cabinets
Built-in kitchen cabinet with drainboards to sink. Medicine cabinets in bathrooms.

Legal Fees
None.

Walks, Steps, Terraces
Concrete walks to front and rear doors and to the garage. Concrete steps to front and rear doors. Large concrete terrace in rear.

Garage
One-car garage of same design and construction as the house. Concrete floor and electric heater.

Driveway
Portland Cement Concrete Driveway.

Landscaping
Shrubs placed attractively around the house. Hedge and flower garden in back yard. Concrete benches and vases in flower garden. Sodding lawn.

Outline Specifications for the Kansas City Home

Surveying, Excavation, and Backfilling
Staking out and clearing trees. Excavation under entire house. Trenches for gas, sewer and water and backfilling.

Basement and Foundations
Footings and walls of reinforced monolithic concrete, porous tile drains and concrete floors.

Concrete Masonry Superstructure
Concrete block for the walls, chimney and fireplace, including the precast concrete mantel.

Carpentry and Millwork
Includes rough lumber for floors, interior partitions, and roof framing. Exterior and interior trim, wood doors and frames. Labor of setting steel sash, mortising locks, etc., weather strips.

Reinforced Concrete Floor Slabs
A 6½ inch reinforced concrete slab over the entire first floor.

Steel Window Sash
All windows.

Stucco
Two undercoats and one decorative coat of Portland Cement Stucco over entire outside surface.

Glazing
Placing glass in all windows and doors.

Lath and Plaster
Scratch and brown coats of hardwall plaster; finish coat of Keen Cement plaster, finished with an antique texture.

Roofing and Sheet Metal Work
Cement asbestos shingles. Zinc flashing gutters and downspouts.

Finish Hardware and Ironwork
Finishing hardware for doors, anchor bolts, porch railing, coal chute, cleanout doors, dampers and ash dump for the fireplace.

Tile Work
Glazed tile in bathroom and linoleum in the kitchen and rear entry and laid with deadening felt.

Hardwood Floors
Clear select white oak flooring throughout, except the kitchen, bathroom and rear entry.

Plumbing Fixtures and Installation
Tub, stool, lavatory and shower upstairs, stool and lavatory in basement, double drain-board sink in kitchen, all of porcelain enamelware. Galvanized iron sink in garage, brass piping laundry tubs.

Concrete Trim Around Windows and Doors
Precast concrete lintels, monolithic poured concrete sills. Mouldings of Portland Cement Stucco.

Quoins—Precast Concrete
None

Electric Wiring and Fixtures
Wiring in cable conduits, two and three way tumbler switches. Thirty-five fixtures and lamps.

Heating and Radiation
Hot water heating system with automatic heat regulators. Automatic gas water heater.

Painting and Decorating
Painting and finishing of all exterior and interior woodwork including wood floors, also the painting of metal windows.

Screens
Roll screens for all steel casement windows. Screens for all exterior doors; copper screening throughout.

Cabinets
Built-in kitchen cabinet, medicine cabinet in bathroom. Metal clothes vault.

Legal Fees
None

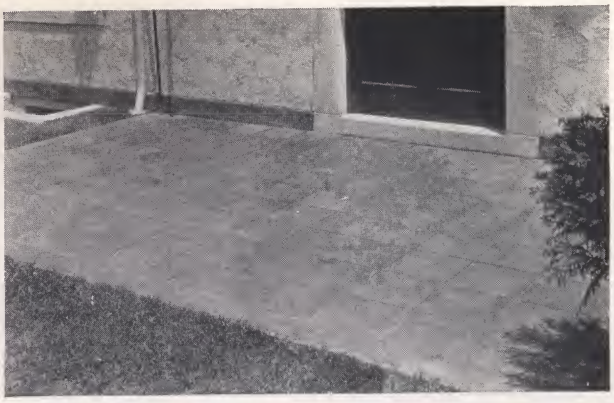
Walks, Steps, Terraces
Concrete sidewalk and steps for front entrance. Concrete stepping stones from front to rear. Concrete terrace in front marked off in squares.

Garage
One-car garage of same design and construction as the house with concrete floor.

Driveway
Portland Cement concrete driveway.

Landscaping
Hedge, trees, shrubs and flower garden. Seeding and sodding lawn.

Portland Cement Concrete Roofing Tile



Concrete Terrace Marked Off as Tile

Outline Specifications for the Birmingham Bungalow

Surveying, Excavation, and Backfilling
Staking out and clearing trees. Partial excavation for basement, trenches for gas, sewer and water and backfilling.

Basement and Foundations
Monolithic concrete for footings, walls and partitions, concrete basement floor and areas.

Concrete Masonry Superstructure
Concrete block for the walls, chimney and fireplace. Monolithic concrete fireplace mantel.

Carpentry and Millwork
Includes the lumber for floors, interior partitions, and roof framing. Exterior and interior trim, wood doors and frames, and sash, weather strips, mortising locks, etc.

Reinforced Concrete Floor Slabs
None

Steel Window Sash
Three steel basement sash.

Stucco
Two undercoats and one decorative coat of Portland Cement Stucco over the entire outside surface, finish with smooth Italian texture.

Glazing
Glazing was done at the factory and is included under Millwork.

Lath and Plaster
Metal lath throughout. Hardwall plaster throughout.

Roofing and Sheet Metal Work
Red concrete roofing tile, copper flashing, steel gutters, and downspouts.

Finish Hardware and Iron Work
Finishing hardware for the doors, windows, etc., anchor bolts, cellar entrance, areaway, coal chute, cleanout door, damper and ash dump for the fireplace.

Tile Work
Glazed tile for the bathroom, rubber tile for kitchen, bathroom and dining alcove; concrete tile for front and rear porches.

Hardwood Floors
Clear select white oak flooring throughout, except kitchen, bathroom, and dining alcove.

Plumbing Fixtures and Installation
Porcelain enamelware on stool and lavatory and in kitchen sink. Nickel plated shower.

Concrete Trim Around Windows and Doors
Precast concrete sills, concrete lintels poured in place.

Quoins—Precast Concrete
None

Electric Wiring and Fixtures
Wiring System conforming to the specifications of the National Board of Fire Underwriters. Complete line of fixtures.

Heating and Radiation
Hot water heating system and automatic gas water heater.

Painting and Decorating
Three coats of lead in oil on the woodwork throughout the house.

Screens
Copper screens on all doors and windows.

Cabinets
Built-in kitchen cabinet, medicine cabinet in bathroom.

Legal Fees and Mortgages, etc.
Commission retained by company making first mortgage loan.

Walks, Steps, Terraces
Concrete walk to front and rear doors. Concrete steps to front and rear doors, also.

Garage
One-car garage of the same design and construction as the house.

Driveway
Portland Cement concrete driveway.

Landscaping
Trees and shrubs around the house; flower garden in the back yard.

Typical Cellar in a Prize Home

Area Walls Cast in Concrete

Building Materials Used in the Lehigh Prize Homes

A number of questions which homebuilders often ask are answered by this simple list of quantities. The list indicates not only how much of the various materials are actually used in building the average house of this type—but serves to show the form in which the materials are purchased and the trade terms of measurement.

Materials Used		Quantities for each prize home			
		New York	Chicago	Kansas City	Birmingham
1 Concrete Tile	5x8x12				4,200
2 Concrete Block	4x8x16		600	360	
3 Concrete Block	8x8x12			139	
4 Concrete Block	8x8x16	2,853	3,710	502	
5 Concrete Block	8x12x16	1,830	1,470	1,606	
6 Concrete Brick	2x4x8			1,900	2,500
7 Cement	Bags	565	550	775	526
8 Hydrated Lime	Bags	92	120	42	97
9 Sand	Cubic yards	87	96	70	68
10 Crushed Stone, Slag or Gravel-cubic yards		60	80	97	43
11 Drain Tile	Lineal feet	170	140	140	182
12 Metal Lath	Square yards	770	707	770	490
13 Fire Brick		145	150	200	146
14 Chimney Flue	Lineal feet	58	62	66	36
15 Plaster	Bags	108	104	110	100
16 Cedar	F. B. M.	1,000		200	400
17 Hardwood Floors	Square feet	1,340	1,701	1,340	1,100
18 Rough Lumber	F. B. M.	21,500	16,500	16,000	15,000
19 Nails	Lbs.	800	500	600	600
20 Linoleum	Square feet		140	140	
21 Rubber Tile	Square feet	203			181
22 Roofing Material	Squares	16	15½	16	17½
23 Building Paper	Rolls	3	3	5	7
24 Concrete Floor Tile	Square feet		60	65	180
25 Prepared Portland Cement Stucco-bags		104			
26 Prepared Portland Cement Plaster-bags		30			

Precast Concrete Mantels Used in Chicago and New York Homes

The Actual Cost of Homebuilding

GEOGRAPHICAL and conditional variations in the cost of materials and labor have, within the past few years, rendered impossible and inadvisable any effort to state standardized costs of homebuilding. The Lehigh Prize Homes represent an experience in homebuilding which is probably a good cross-section of average results.

For the three types of dwelling plans used (New York being the same plan as Kansas City) there will be found on this and the following page an itemized statement of costs which represent the major items of construction. The homebuilder may thus make his own deductions, adding or leaving out special items as he may need to fit this experience to his own project.

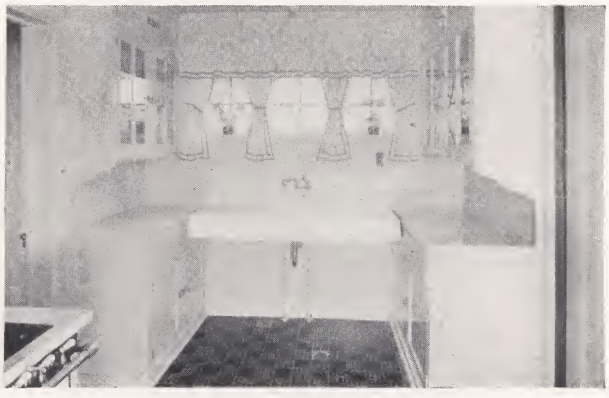
It is obvious and probably logical that homebuilding should be considerably more expensive in the environs of the larger cities where competition for labor and materials is far keener than in the less populated districts.

The cost items presented herewith are arranged in non-technical form so they can be understood readily and in each instance the item is made of labor and material cost combined to give a total.

Actual Cost Figures on the First Prize House

As built in Kansas City and typical of most districts except high cost areas in larger cities where 20% should be added

1. Surveying, excavation and back-filling	$217.10	11. Finish hardware and ironwork	$326.68
2. Basement and foundations	1,140.11	12. Tile work	634.34
3. Concrete masonry superstructure	1,175.36	13. Hardwood floors	284.00
4. Carpentry and millwork	2,365.37	14. Plumbing fixtures and installation	891.28
5. Reinforced concrete floor slabs	425.72	15. Concrete door and window trim	663.00
6. Steel window sash	298.14	16. Electric wiring and fixtures	604.49
7. Stucco	341.00	17. Heating and radiation	934.00
8. Glazing	61.00	18. Painting and decorating	770.00
9. Lath and plaster	954.95	19. Screens	272.00
10. Roofing and sheet metal work	869.33	20. Cabinets	190.00
		Total	$13,417.87



Bathroom and Kitchen as Built in the First Prize Home, Kansas City

Actual Cost Figures on the Second Prize House

As built in Chicago where costs were found considerably higher than average—a condition typical of large cities

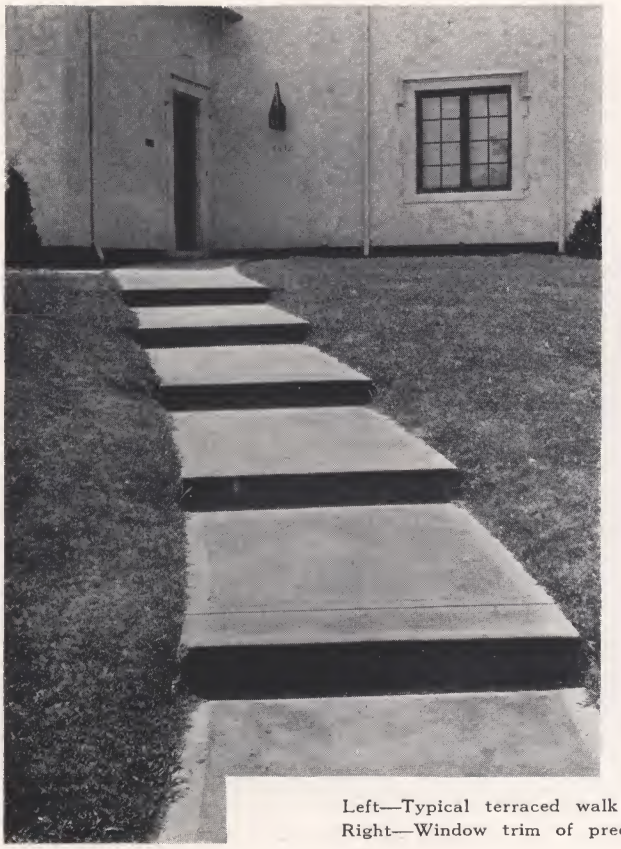
1. Surveying, excavation, backfilling	$578.73	11. Tile work	$294.00
2. Basement and foundation	2,066.45	12. Hardwood floors	606.94
3. Concrete masonry superstructure	2,557.32	13. Plumbing fixtures and installation	1,818.90
4. Carpentry and millwork	2,944.27	14. Concrete trim at windows and doors	215.00
5. Steel window sash	736.00	15. Quoins—precast concrete	452.40
6. Stucco	668.63	16. Electric wiring and fixtures	601.73
7. Glazing	155.00	17. Heating and radiation	2,000.60
8. Lath and plaster	1,165.37	18. Painting and decorating	904.00
9. Roofing and sheet metal work	616.00	19. Screens	499.23
10. Finish hardware and ironwork	497.25	20 Cabinets	68.50
		Total	$19,446.32

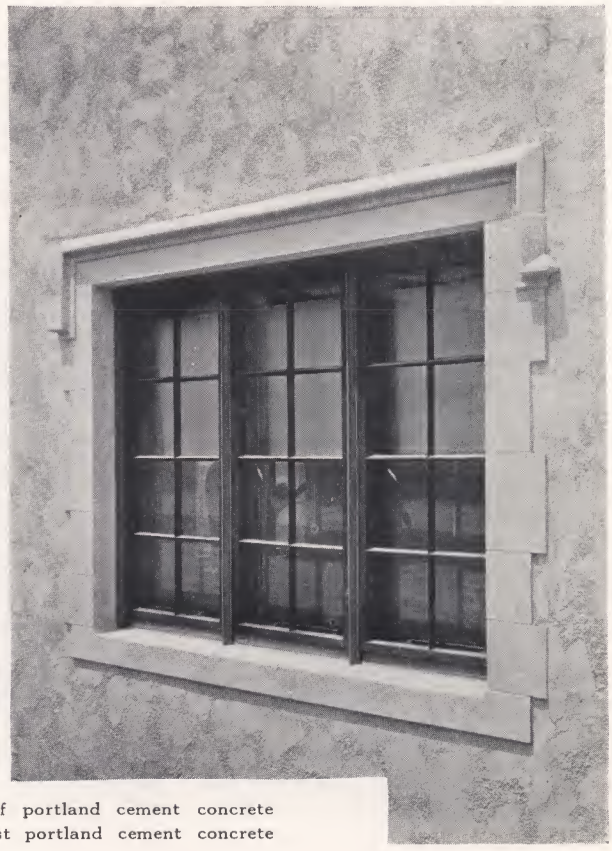
Actual Cost Figures on the First Prize Bungalow

As built in Birmingham and typical of most districts where climatic conditions do not require specification changes

1. Surveying, excavation, backfilling	$179.31	10. Tile work	$817.43
2. Basement and foundation	778.47	11. Hardwood floors	164.90
3. Concrete masonry superstructure	899.19	12. Plumbing fixtures and installation	797.00
4. Carpentry and millwork	2,184.49	13. Concrete trim at windows and doors	45.65
5. Steel window sash	42.00	14. Electric wiring and fixtures	339.75
6. Stucco	595.50	15. Heating and radiation	717.00
7. Lath and plaster	668.00	16. Painting and decorating	374.10
8. Roofing and sheet metal work	582.00	17. Screens	149.70
9. Finish hardware and ironwork	174.30	18. Cabinets	62.21
		Total	$9,571.00

Demonstration walls which show concrete masonry construction with exterior and interior finishes. (Left) Inside of wall finished in metal lath and 3 coat plaster. (Right) Exterior finish of 3 coat portland cement stucco





Left—Typical terraced walk of portland cement concrete
Right—Window trim of precast portland cement concrete

Lehigh Portland Cement For Building Better Homes

NOW that the story of "Building Better Homes" has been told and the methods and materials of concrete masonry construction fully described in text and picture, based on actual experience, it seems in order to say a few words about the basic material from which this entire system of permanent economical home building has been evolved.

Entrance Hall in Kansas City Home

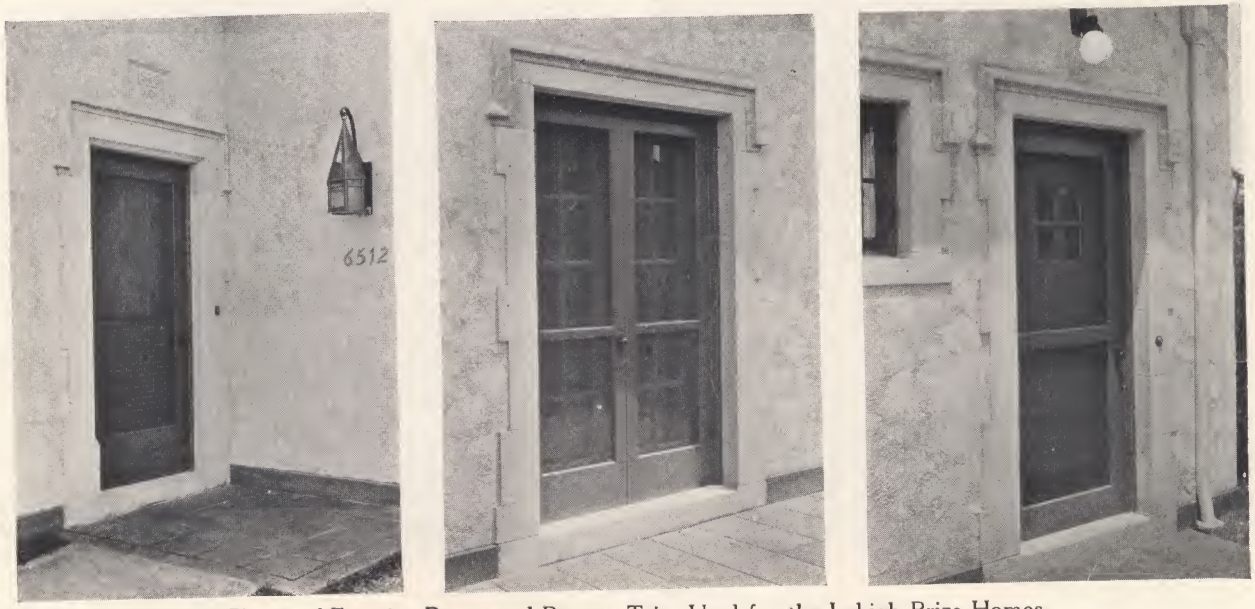
Portland cement is a product which has long been accepted as a most excellent material for the building of permanent structures of all types. Everyone is familiar with concrete and cement work as it is seen in many forms throughout the urban and rural districts of America. Wherever strength, durability and safety against fire are requirements of a structure, there will be found portland cement products in many forms. Bridges which span our greatest rivers; huge factory buildings; commercial buildings of all types; roads; walls and dams will be found built of portland cement products.

Even as the use of portland cement has proven its enduring qualities for all structural purposes, so full confidence can be placed in concrete masonry construction as applied to the home building field. This is not a new system of building homes—every phase of the operation has been proven time after time. Consequently, it remains only for the homebuilder to realize in how many forms portland cement can be used in building permanent fire-safe buildings for which low maintenance costs are guaranteed by the inherent qualities of portland cement.

Lehigh Portland Cement comes to the homebuilder's job in two forms—in bags ready for mixing concrete and stucco on the job; and in the form of various concrete products such as concrete building blocks and building tile; precast structural and decorative units, including sills, lintels, exterior trim, mantels, chimney pots, quoins, etc., and roofing tile or shingles.

Building material dealers who handle Lehigh Cement can be found anywhere—and where the blue and white Lehigh sign is displayed there will be found good practical advice as well as good cement.

Portland cement concrete masonry products are produced and are sold by individual manufacturers whose local plants will be found located in every part of the country. Just ask for the concrete block plant and there you will find all forms of structural and decorative precast portland cement concrete.



Types of Exterior Doors and Precast Trim Used for the Lehigh Prize Homes

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